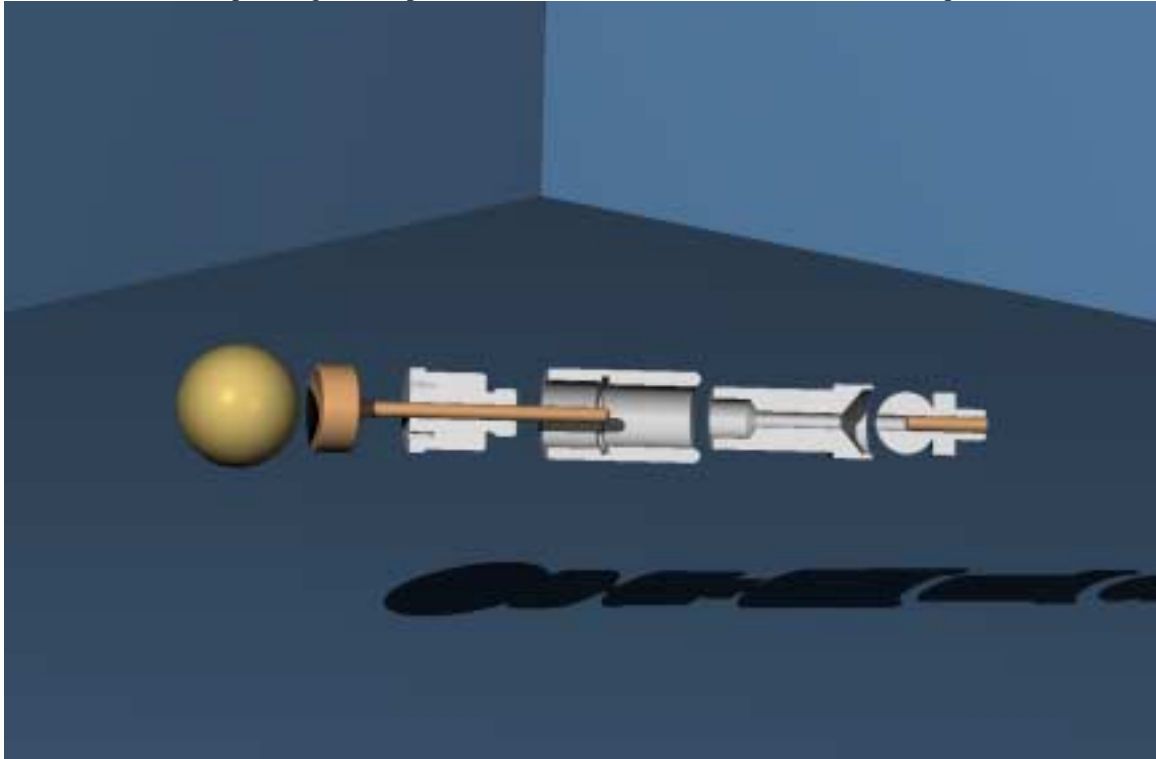


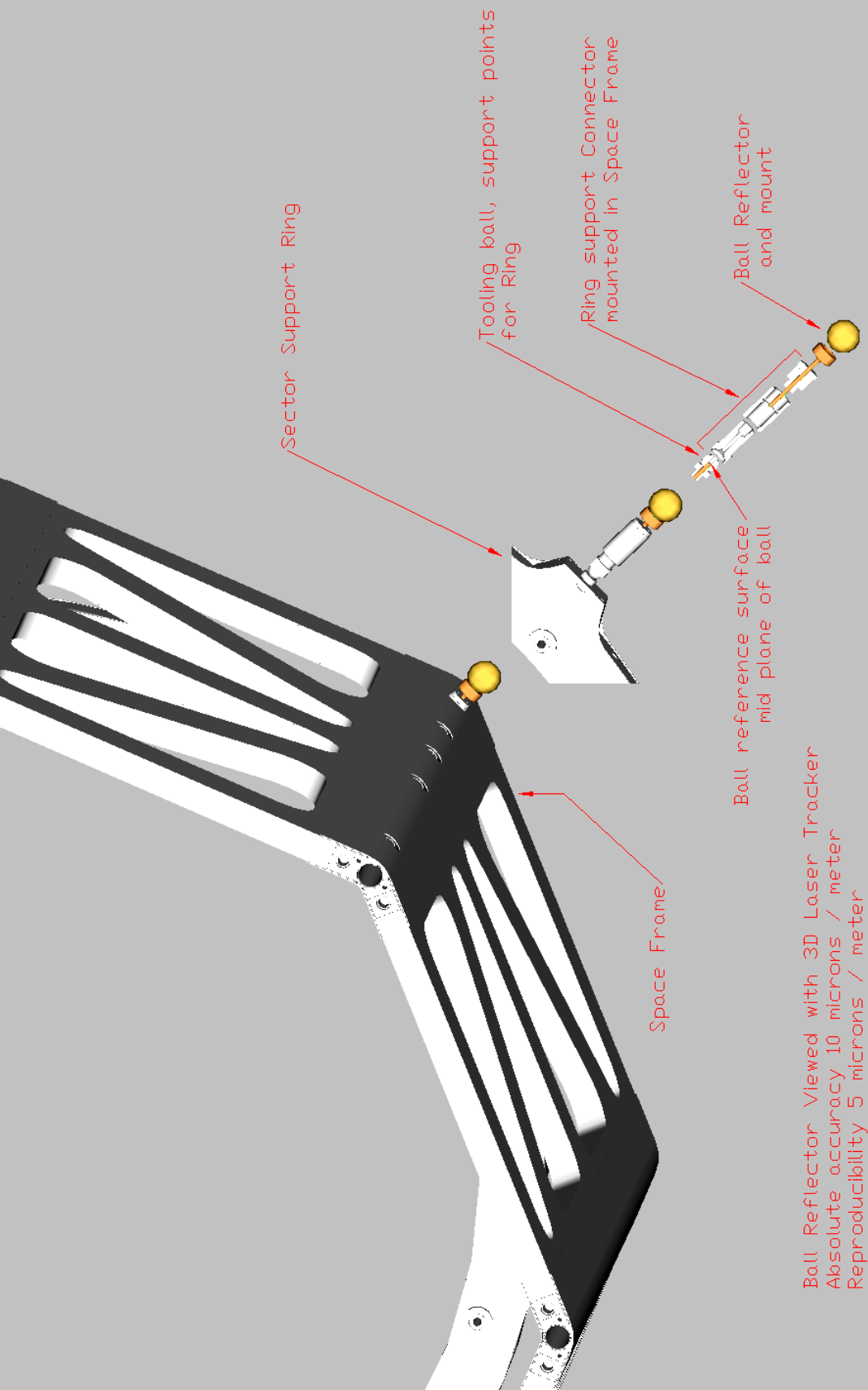
Atlas Pixal Survey

With detectors mounted on sectors and using mounting holes to construct datum measure all detector targets relative to datum on both sides.

With sectors mounted on sector support ring and using support balls for datum re-measure subset of targets relative support ball datum.

After sector support ring is mounted in space frame the position of ring support balls is transferred through the space frame by a probe with a magnetic cup at one end that supports a ball reflector. The probe runs down the axis of the support ball connector that is bonded into the space frame. By making two measurements one with the probe full in and another practically in the location of the ball is known. Other sockets to except a magnetic cup for the ball reflectors would be bonded into the space frame





Ball Reflector Viewed with 3D Laser Tracker
Absolute accuracy 10 microns / meter
Reproducibility 5 microns / meter

Measuring principle of the 3D Laser Tracker LTD500

Basic Principle

The combination of horizontal and vertical angle measurements with distance measurements allows determining the 3D coordinates of a reflector within any tool or part coordinate system. Motors support fully automated measurements and a position detector guarantees high speed tracking capabilities.

Leica's Key Technology

While the angles are measured with high precision encoders, distances can be derived from Leica's patented absolute or interferometric distance measuring devices.

Laser Tracker LT(D) 500

The LT500 incorporates the interferometer technology for precise and fast tracking and scanning jobs.

The LTD500 with the additional absolute distance measuring device increases productivity, flexibility and automation.

Flexible positioning

The Laser Tracker can be mounted on Leica's portable stand or any other state of the art height adjustable device. In addition vertical positioning of the measurement head is possible.

High precision horizontal and vertical angle encoders

Hand held reflector for object probing

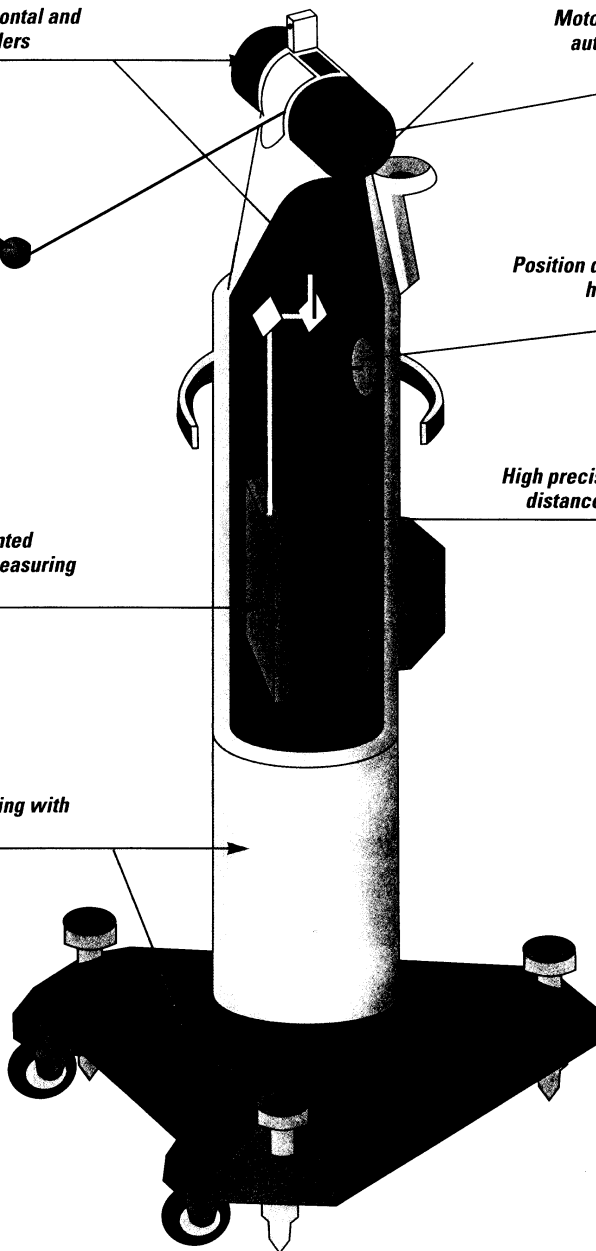
Motors for tracking and automatic positioning

Position detector for precise high-speed tracking

High precision interferometer distance measuring device

High precision patented absolute distance measuring device

Convenient positioning with portable stand



Specifications

Tracking

Max. target speed

at right angles to the laser beam > 4.0 m/s
in the direction of the laser beam > 6.0 m/s

Max. acceleration

in all directions > 2 g

Range of measurement

horizontal $\pm 235^\circ$
vertical $\pm 45^\circ$ *APPROX. 100 GONS*
distance 0–35 m (0–115')
Retroreflector air path corner cube,
catelye, solid glass
corner cube

Accuracy

Angle resolution 2σ 0.14"
Distance resolution 2σ 1.26 μm
Reproducibility of a coordinate* $\pm 5 \text{ ppm } (\mu\text{m/m})$
Absolute accuracy of a coordinate*
for non-moving target (static) $\pm 10 \text{ ppm } (\mu\text{m/m})$
for moving target (dynamic) $\pm 20\text{--}40 \text{ ppm } (\mu\text{m/m})$

Laser Interferometer

Principle of operation

Single-beam interferometer heterodyne
Class 2 Laser Product < 0.3 mW/CW
Wave length 633 nm (visible)
Beam diameter (1/e2) ca. 4.5 mm

Absolut Distance Meter (only LTD500)

Principle of operation

light polarization modulation
Resolution 1 μm
Accuracy* $\pm 0,05 \text{ mm } (0.002")$
Measurement range 2–35 m (7–115')
Class 1 Laser Product < 0.5 mW/2 sec.
Wave length 780 nm (infrared)
Beam diameter ca. 10 mm

Note:

The accuracy shown above (*) is stated as a 2σ (sigma) value.
In North America, it is customary to state accuracy as a 1σ (sigma) value.
In an approximation 1σ values can be derived by deviding 2σ values by two.

LTD500 is manufactured under the following US patents: Nr. 4714339 and Nr. 5530549.
Other US and international patents pending.

Ambient Conditions

Working temperature

(three ranges) $+5^\circ\text{--}+40^\circ \text{C } +41^\circ\text{--}+104^\circ \text{F}$

Storage temperature

$-10^\circ\text{--}+60^\circ \text{C } +14^\circ\text{--}+140^\circ \text{F}$

Relative humidity

10–90%
(non-condensing)

Air pressure/elevation

operation 0–3000 m 0–10000 ft
storage 0–7000 m 0–23000 ft

Dimensions and Weight

Sensor unit

dimensions LT500/LTD500 220 x 280 x 855 mm
8.7" x 11" x 33.7"
transit axis height 805 mm 31.7"
weight LT500 30.0 kg 66.1 lb
weight LTD500 31.5 kg 69.0 lb

Controller

dimension 455 x 350 x 200 mm
17.9" x 13.8" x 7.9"
weight 10.5 kg 23.1 lb

Recommended System Computer

Personal Computer

Operating system Compaq PentiumTM
Windows[®] 95, 97, 98 or
NT4.0

Rate of measurement

up to 1000 points/sec.
via parallel interface

